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Published: 07 July 2020

Retrospective and forward prediction of next strong earthquakes in oceanic ridges and trenches using probabilistic models

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Journal of Seismology (2020)Cite this article

## Abstract

Earthquake occurrence and recurrence depend on number of factors beyond mere observations. These include seismotectonic nature of the region, spreading rate of the ridge or subduction of plates causing the trench, active or otherwise nature of the fault on crust (on land), stress-strain regime, and so on. In this work, the recurrence and expected times of next strong earthquakes ( $M \geq 6$ ) in the oceanic ridges and trenches were computed using gamma and lognormal probabilistic models. Summing the occurrence times of last strong earthquakes and these recurrence times, expected times of the next strong earthquakes were retrospectively and forwardly predicted. The expected times of the next strong earthquakes retrospectively predicted correlated with the recorded strong earthquakes in the earthquake catalog of the Advance National Seismic System (ANSS) hosted by the Northern California Earthquake Data Centre, USA, for the period of 1978–2017 in a readable format. The successful prediction of the expected times of the next strong earthquakes retrospectively is an indication that the expected times of the next strong earthquakes forwardly predicted in the regions of study will be positive. However, since the occurrence and recurrence of earthquakes depend on many factors, it is therefore important to note that it may not always be accurate to predict future earthquakes from retrospective perspective. Nonetheless, this work is a good effort, and it has thrown up some interesting results.

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## Acknowledgments

We sincerely acknowledge the professional contributions of the handling editor and the reviewers of this article.

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Hammed, O.S., Adagunodo, T.A., Fagbemigun, T.S. et al. Retrospective and forward prediction of next strong earthquakes in oceanic ridges and trenches using probabilistic models. J Seismol (2020). <https://doi.org/10.1007/s10950-020-09938-z>

Download citation

Received 18 November 2019

Accepted 21 June 2020

Published 07 July 2020

DOI <https://doi.org/10.1007/s10950-020-09938-z>

Keywords

Recurrence times

Expected times

Gamma model

Lognormal model

Oceanic ridges

Oceanic trenches

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